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A SUGGESTION ABOUT MYSTICISM

MUCH interest in the subject of religious mysticism has been shown in philosophic circles of late years. Most of the writings I have seen have treated the subject from the outside, for I know of no one who has spoken as having the direct authority of experience in favor of his views. I also am an outsider, and very likely what I say will prove the fact loudly enough to readers who possibly may stand within the pale. Nevertheless, since between outsiders one is as good as another, I will not leave my suggestion unexpressed.

The suggestion, stated very briefly, is that states of mystical intuition may be only very sudden and great extensions of the ordinary "field of consciousness." Concerning the causes of such extensions I have no suggestion to make; but the extension itself would, if my view be correct, consist in an immense spreading of the margin of the field, so that knowledge ordinarily transmarginal would become included, and the ordinary margin would grow more central. Fechner's "wave-scheme" will diagrammatize the alteration, as I conceive it, if we suppose that the wave of present awareness, steep above the horizontal line that represents the plane of the usual "threshold," slopes away below it very gradually in all directions. A fall of the threshold, however caused, would, under these circumstances, produce the state of things which we see on an unusually flat shore at the ebb of a spring-tide. Vast tracts usually covered are then revealed to view, but nothing rises more than a few inches above the water's bed, and great parts of the scene are submerged again, whenever a wave washes over them.

Some persons have naturally a very wide, other a very narrow, field of consciousness. The narrow field may be represented by an unusually steep form of the wave. When by any accident the threshold lowers, in persons of this type—I speak here from direct personal experience—so that the field widens and the relations of its center to matters usually subliminal come into view, the larger pano-

rama perceived fills the mind with exhilaration and sense of mental power. It is a refreshing experience; and—such is now my hypothesis—we only have to suppose it to occur in an exceptionally extensive form, to give us a mystical paroxysm, if such a term be allowed.

A few remarks about the field of consciousness may be needed to give more definiteness to my hypothesis. The field is composed at all times of a mass of present sensation, in a cloud of memories, emotions, concepts, etc. Yet these ingredients, which have to be named separately, are not separate, as the conscious field contains them. Its form is that of a much-at-once, in the unity of which the sensations, memories, concepts, impulses, etc., coalesce and are dissolved. The present field as a whole came continuously out of its predecessor and will melt into its successor as continuously again, one sensation-mass passing into another sensation-mass and giving the character of a gradually changing *present* to the experience, while the memories and concepts carry time-coefficients which place whatever is present in a temporal perspective more or less vast.

When, now, the threshold falls, what comes into view is not the next mass of *sensation;* for sensation requires new physical stimulations to produce it, and no alteration of a purely mental threshold can create these. Only in case the physical stimuli were already at work subliminally, preparing the next sensation, would whatever sub-sensation was already prepared reveal itself when the threshold fell. But with the memories, concepts, and conational states, the case is different. Nobody knows exactly how far we are "marginally" conscious of these at ordinary times, or how far beyond the "margin" of our present thought trans-marginal consciousness of them may exist.[1] There is at any rate no definite bound set between what is central and what is marginal in consciousness, and the margin itself has no definite bound *a parte foris.* It is like the field of vision, which the slightest movement of the eye will extend, revealing objects that always stood there to be known. My hypothesis is that a movement of the threshold downwards will similarly bring a mass of subconscious memories, conceptions, emotional feelings, and perceptions of relation, etc., into view all at once; and that if this enlargement of the nimbus that surrounds the sensational present

[1] Transmarginal or subliminal, the terms are synonymous. Some psychologists deny the existence of such consciousness altogether (A. H. Pierce, for example, and Münsterberg apparently). Others, *e. g.,* Bergson, make it exist and carry the whole freight of our past. Others again (as Myers) would have it extend (in the "telepathic" mode of communication) from one person's mind into another's. For the purposes of my hypothesis I have to postulate its existence; and once postulating it, I prefer not to set any definite bounds to its extent.

is vast enough, while no one of the items it contains attracts our attention singly, we shall have the conditions fulfilled for a kind of consciousness in all essential respects like that termed mystical. It will be transient, if the change of threshold is transient. It will be of reality, enlargement, and illumination, possibly rapturously so. It will be of unification, for the present coalesces in it with ranges of the remote quite out of its reach under ordinary circumstances; and the sense of *relation* will be greatly enhanced. Its form will be intuitive or perceptual, not conceptual, for the remembered or conceived objects in the enlarged field are supposed not to attract the attention singly, but only to give the sense of a tremendous *much-ness* suddenly revealed. If they attracted attention separately, we should have the ordinary steep-waved consciousness, and the mystical character would depart.

Such is my suggestion. Persons who *know* something of mystical experience will no doubt find in it much to criticize. If any such shall do so with definiteness, it will have amply served its purpose of helping our understanding of mystical states to become more precise.

The notion I have tried (at such expense of metaphor) to set forth was originally suggested to me by certain experiences of my own, which could only be described as very sudden and incomprehensible enlargements of the conscious field, bringing with them a curious sense of cognition of real fact. All have occurred within the past five years; three of them were similar in type; the fourth was unique.

In each of the three like cases, the experience broke in abruptly upon a perfectly commonplace situation and lasted perhaps less than two minutes. In one instance I was engaged in conversation, but I doubt whether the interlocutor noticed my abstraction. What happened each time was that I seemed all at once to be reminded of a past experience; and this reminiscence, ere I could conceive or name it distinctly, developed into something further that belonged with it, this in turn into something further still, and so on, until the process faded out, leaving me amazed at the sudden vision of increasing ranges of distant fact of which I could give no articulate account. The mode of consciousness was perceptual, not conceptual—the field expanding so fast that there seemed no time for conception or identification to get in its work. There was a strongly exciting sense that my knowledge of past (or present?) reality was enlarging pulse by pulse, but so rapidly that my intellectual processes could not keep up the pace. The *content* was thus entirely lost to retrospection—it sank into the limbo into which dreams vanish as we gradually awake. The feeling—I won't call it belief—that I

had had a sudden *opening,* had seen through a window, as it were, distant realities that incomprehensibly belonged with my own life, was so acute that I can not shake it off to-day.

This conviction of fact-revealed, together with the perceptual form of the experience and the inability to make articulate report, are all characters of mystical states. The point of difference is that in my case certain special directions only, in the field of reality, seemed to get suddenly uncovered, whereas in classical mystical experiences it appears rather as if the whole of reality were uncovered at once. *Uncovering* of some sort is the essence of the phenomenon, at any rate, and is what, in the language of the Fechnerian wave-metaphor, I have used the expression "fall of the threshold" to denote.

My fourth experience of uncovering had to do with dreams. I was suddenly intromitted into the cognizance of a pair of dreams that I could not remember myself to have had, yet they seemed somehow to connect with me. I despair of giving the reader any just idea of the bewildering confusion of mind into which I was thrown by this, the most intensely peculiar experience of my whole life. I wrote a full memorandum of it a couple of days after it happened, and appended some reflections. Even though it should cast no light on the conditions of mysticism, it seems as if this record might be worthy of publication, simply as a contribution to the descriptive literature of pathological mental states. I let it follow, therefore, as originally written, with only a few words altered to make the account more clear.

"San Francisco, Feb. 14th 1906.—The night before last, in my bed at Stanford University, I woke at about 7.30 A.M., from a quiet dream of some sort, and whilst gathering my waking wits, seemed suddenly to get mixed up with reminiscences of a dream of an entirely different sort, which seemed to telescope, as it were, into the first one, a dream very elaborate, of lions, and tragic. I concluded this to have been a previous dream of the same sleep; but the apparent mingling of two dreams was something very queer, which I had never before experienced.

"On the following night (Feb. 12–13) I awoke suddenly from my first sleep, which appeared to have been very heavy, in the middle of a dream, in thinking of which I became suddenly confused by the contents of two other dreams that shuffled themselves abruptly in between the parts of the first dream, and of which I couldn't grasp the origin. Whence come *these dreams?* I asked. They were close to *me,* and fresh, as if I had just dreamed them; and yet they were far away *from the first dream.* The contents of

the three had absolutely no connection. One had a cockney atmosphere, it had happened to some one in London. The other two were American. One involved the trying on of a coat (was this the dream I seemed to wake from?) the other was a sort of nightmare and had to do with soldiers. Each had a wholly distinct emotional atmosphere that made its individuality discontinuous with that of the others. And yet, in a moment, as these three dreams alternately telescoped into and out of each other, and I seemed to myself to have been their common dreamer, they seemed quite as distinctly *not* to have been dreamed in succession, in that one sleep. *When,* then? Not on a previous night, either. *When,* then? and *which* was the one out of which I had just awakened? *I could no longer tell:* one was as close to me as the others, and yet they entirely repelled each other, and I seemed thus to belong to three different dream-systems at once, no one of which would connect itself either with the others or with my waking life. I began to feel curiously confused and *scared,* and tried to wake myself up wider, but I seemed already wide-awake. Presently cold shivers of dread ran over me: *am I getting into other people's dreams?* Is this a 'telepathic' experience? Or an invasion of double (or treble) personality? Or is it a thrombus in a cortical artery? and the beginning of a general mental 'confusion' and disorientation which is going on to develop who knows how far?

"Decidedly I was losing hold of my 'self,' and making acquaintance with a quality of mental distress that I had never known before, its nearest analogue being the sinking, giddying anxiety that one may have when, in the woods, one discovers that one is really 'lost.' Most human troubles look towards a terminus. Most fears point in a direction, and concentrate towards a climax. Most assaults of the evil one may be met by bracing oneself against something, one's principles, one's courage, one's will, one's pride. But in this experience all was diffusion from a centre, and foothold swept away, the brace itself disintegrating all the faster as one needed its support more direly. Meanwhile vivid perception (or remembrance) of the various dreams kept coming over me in alternation. Whose? *whose?* WHOSE? Unless I can *attach* them, I am swept out to sea with no horizon and no bond, getting *lost.* The idea aroused the 'creeps' again, and with it the fear of again falling asleep and renewing the process. It had begun the previous night, but then the confusion had only gone one step, and had seemed simply curious. *This* was the second step—where might I be after a third step had been taken? My teeth chattered at the thought.

"At the same time I found myself filled with a new pity towards persons passing into dementia with *Verwirrtheit,* or into invasions of secondary personality. *We* regard them as simply *curious;* but

what *they* want in the awful drift of their being out of its customary self, is any principle of steadiness to hold on to. We ought to assure them and reassure them that we will stand by them, and recognize the true self in them to the end. We ought to let them know that we are with *them* and not (as too often we must seem to them) a part of the world that but confirms and publishes their deliquescence.

"Evidently I was in full possession of my reflective wits; and whenever I thus objectively thought of the situation in which I was, my anxieties ceased. But there was a tendency to relapse into the dreams and reminiscences, and to relapse vividly; and then the confusion recommenced, along with the emotion of dread lest it should develop farther.

"Then I looked at my watch. Half past twelve! Midnight, therefore. And this gave me another reflective idea. Habitually, on going to bed, I fall into a very deep slumber from which I never naturally awaken until after two. I never awaken, therefore, from a midnight dream, as I did to-night, so of midnight dreams my ordinary consciousness retains no recollection. My sleep seemed terribly heavy as I woke to-night. Dream states carry dream memories—why may not the two succedaneous dreams (whichever two of the three *were* succedaneous) be memories of *twelve o'clock dreams of previous nights,* swept in, along with the just-fading dream, into the just-waking system of memory? Why, in short, may I not be tapping, in a way precluded by my ordinary habit of life, *the midnight stratum* of my past experiences?

"This idea gave great relief—I felt now as if I were in full possession of my *anima rationalis.* I turned on my light, resolving to read myself to sleep. But I didn't read, I felt drowsy instead, and, putting out the light, soon was in the arms of Morpheus.

"I woke again two or three times before daybreak with no dream-experiences, and finally, with a curious, but not alarming, confusion between two dreams, similar to that which I had had the previous morning, I awoke to the new day at seven.

"Nothing peculiar happened the following night, so the thing seems destined not to develop any further."[2]

[2] I print the rest of my memorandum in the shape of a note:—

"Several ideas suggest themselves that make the observation instructive.

"First, the general notion, now gaining ground in mental medicine, that certain mental maladies may be foreshadowed in dream-life, and that therefore the study of the latter may be profitable.

"Then the specific suggestion, that states of 'confusion,' loss of personality, *apraxia,* etc., so often taken to indicate cortical lesion or degeneration of demented type, may be very superficial functional affections. In my own case the confusion was *foudroyante*—a state of consciousness unique and unparalleled in my 64 years of the world's experience; yet it alternated quickly with

The distressing confusion of mind in this experience was the exact opposite of mystical illumination, and equally unmystical was the definiteness of what was perceived. But the exaltation of the sense of relation was mystical (the perplexity all revolved about the fact that the three dreams *both did and did not belong in the most intimate way together*); and the sense that *reality was being uncovered* was mystical in the highest degree. To this day I feel that those extra dreams were dreamed in reality, but when, where, and by whom, I can not guess.

In the *Open Court* for December, 1909, Mr. Frederick Hall narrates a fit of ether-mysticism which agrees with my formula very well. When one of his doctors made a remark to the other, he chuckled, for he realized that these friends "believed they saw real things and causes, but they *didn't,* and I did. . . . I was where the causes *were* and to see them required no more mental ability than to recognize a color as blue. . . . The knowledge of how little [the doctors] actually did see, coupled with their evident feeling that they saw all there was, was funny to the last degree. . . . [They] knew as little of the real causes as does the child who, viewing a passing train and noting its revolving wheels, supposes that they, turning of themselves, give to coaches and locomotive their momentum. Or imagine a man seated in a boat, surrounded by dense fog, and out of the fog seeing a flat stone leap from the crest of one wave to another. *If he had always sat thus,* his explanations must be very crude as compared with those of a man whose eyes could pierce fog, and who saw upon the shore the boy skipping stones. In some such way the remarks of the two physicians seemed to me like the last two 'skips' of a stone thrown from my side. . . . All that was essential in the remark I knew before it was made. Thus to discover convincingly and for myself, that the things which are unseen are those of real importance, this was sufficiently stimulating."

It is evident that Mr. Hall's marginal field got enormously enlarged by the ether, yet so little defined as to its particulars that

perfectly rational states, as this record shows. It seems, therefore, merely as if the threshold between the rational and the morbid state had, in my case, been temporarily lowered, and as if similar confusions might be very near the line of possibility in all of us.

"There are also the suggestions of a telepathic entrance into some one else's dreams, and of a doubling up of personality. In point of fact I don't know now 'who' had those three dreams, or which one 'I' first woke up from, so quickly did they substitute themselves back and forth for each other, discontinuously. Their discontinuity was the pivot of the situation. My sense of it was as 'vivid' and 'original' an experience as anything Hume could ask for. And yet they kept telescoping!

"Then there is the notion that by waking at certain hours we may tap distinct strata of ancient dream-memory."

what he perceived was mainly the thoroughgoing causal integration of its whole content. That this perception brought with it a tremendous feeling of importance and superiority is a matter of course.

I have treated the phenomenon under discussion as if it consisted in the uncovering of tracts of *consciousness*. Is the consciousness already there waiting to be uncovered? and is it a veridical revelation of reality? These are questions on which I do not touch. In the subjects of the experience the "emotion of conviction" is always strong, and sometimes absolute. The ordinary psychologist disposes of the phenomenon under the conveniently "scientific" head of *petit mal*, if not of "bosh" or "rubbish." But we know so little of the noetic value of abnormal mental states of any kind that in my own opinion we had better keep an open mind and collect facts sympathetically for a long time to come. We shall not *understand* these alterations of consciousness either in this generation or in the next.

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SOME NEGLECTED PARADOXES OF VISUAL SPACE. III

POWERFUL influences have been driving most philosophical discussions of space and time into the narrow and, in my opinion, errant grooves of geometry and psychologistic biology. Beginning with his space concepts, for instance, the geometer so manipulates them, intentionally in a pure deduction, that their ultimate meaning is paradox and paradox. Likewise the biologist: he sets out with sensations and perceptions of space and, trying to find them over again in the very same spatial universe where these experiences have grown up, ends perforce in a muddle. That something may have been gained by both investigators, nobody need doubt; but the meager and irregular returns of their investment of strenuosity encourage the philosopher to strike from another angle. The following remarks would do just this. They should be looked upon as an experiment, to be judged entirely by its fruits.

I am again going to look at space, neither as a geometer nor as a psychologist of the schools. I shall not deduce the implications of certain Euclidean or non-Euclidean concepts of extension, direction, position, magnitude, etc., nor shall I inquire into the upbuilding of space *qualia* into space concepts. I shall only accept the natural space-world—the world that all ordinary persons somehow or other have come to rely upon—and, secondly, the adaptive, self-changing, specializing nervous organism, as it is known in its broader outlines

and behavior to modern biology. And I shall then ask about two striking peculiarities of this organism's adaptation to this extended world in which it must find itself: first, about the correspondence of spatial form between the retinal image of a perceived thing and the thing perceived; then about the vastly more important reflex imitation. The constant purpose, in each case, will be to discover whether an organism would be more likely to develop as our own actually have in a world which stretches out essentially as we think our world does or in a world whose spaces are all forms of consciousness —or, as I prefer to put the Kantian thought, hyperchemisms. However otiose this purpose may seem to professional epistemologists, it can not but loom large to any biologist who, be it with Driesch and Wolff or with Pauly and Francée, looks ahead to the horizon of his science, where the philosopher's sky comes down to meet it. For, if organic differentiations, particularly those involved in the development of perceptions of and reactions to visual space, can not be explained on the Kantian hypothesis of hyperchemistry, then every biologist faces a momentous dilemma. Either he must cling to the idealistic hypothesis about space, following Driesch, and cast out, root and branch, every principle of ontogenetic and phylogenetic explanation which in any wise involves the notion of spatial adaptation to a genuinely spatial environment; or else, retaining this notion and its derivative explanations, he must winnow from his faith and his literature the reams of idealistic epistemology which, through Mach, Pearson, and many other scientists, he has borrowed from a century-old metaphysic. One need not be versed in any science in order to sense the wide, long consequences of accepting squarely either alternative. The better part of theoretical biology, and not a little of similar flights in many other fields, would have to be done over again, were the dilemma accepted.

I. *Retinal Image and Perceived Form*

One of the first tricks which poor little sophomores are taught, after falling into the hands of the psychologist, is to regard as a most unhappy accident the correspondence of form between the (miscalled) retinal image and the thing seen as the result of that image's presence. "What you see," says the teacher, "has no such immediate connection with the ether vibrations which strike the periphery of your optic tract. It is some kind of nerve current which you really come to know when it gets to your cortex and does something there." And then Thomas Brown is cited. "If," he has written in his Lectures, "this (the shape of the nervous expanse affected peripherally) alone were necessary, we should have square inches and half-inches and various other forms, rectilinear and curvi-

linear, of fragrance and sound." And, to drive the point home, Professor James's lucid foot-note ("Principles of Psychology," II., 144) has the last say. It represents the almost unanimous conviction of contemporary psychologists and philosophers so accurately that it must be quoted.

"In the matter of *spatial* feeling, . . . it looks at first sight as if the sensation might be a direct cognition of its own neural condition. Were this true, however, our sensation should be one of *multitude* rather than of continuous extent; for the condition is *number* of optical nerve-termini, and even this is only a remote condition and not an immediate condition. The immediate condition of the feeling is not the process in the retina, but the process in the brain; and the process in the brain may, for aught we know, be as unlike a triangle (the figure used in a previous illustration),—nay, it probably is so,—as it is unlike redness or rage. It is simply a *coincidence* that in the case of space one of the organic conditions . . . should lead to a representation in the mind of the subject observed similar to that which it produces in the psychological observer. In no other case is the coincidence found. Even should we admit that we cognize triangles in space because of our immediate cognition of the triangular shape of our excited group of nerve-tips, the matter would hardly be more transparent, for the mystery would still remain, why are we so much better cognizant of triangles on our finger-tips than on the nerve-tips of our back, on our eye than on our ear, and on any of these parts than in our brain?"

Straining to its highest tension my frail will to believe, I have been able to detect not the slightest plausibility in all this, probably because I suffer from congenital realism. Laboring under the infirmities of this disease, though, I fancy I discern there three or four contentions profoundly opposed, in spirit if not in word, to thoroughgoing realism. And, as I am here trying out such a realism on the stubborner facts of space, its objections to Professor James's note must find voice.

1. It is not true that, if a percept were somehow a mental copy of the pattern of ether waves at the retina, multitude should be the thing or character perceived. For, if we follow the usual hypothesis and say that each rod and cone yields a sensation of extension, clearly we must admit (1) that the space between rods and cones is visually non-existent and hence can not form a visible gap between the sensed spaces; and (2) that no primordial extension quale, such as any single rod or cone delivers, can possibly contain empirically an awareness of its own spatial limits, but must be absolutely boundless, when viewed from inside, as it were, or by itself. To do justice to this objection to Professor James's point I must refer the reader to two previous articles in this series (this JOURNAL, Vol. VI., Nos. 22 and 24). I would urge, as a result of these studies, that the continuous extent whose presence encourages Professor James and almost everybody else to discredit the retinal image is absolutely no evidence against the latter. For every totality of simul-

taneously given extensions is, one might say, by definition a space continuum just because it consists of *all* given spaces. To suppose that *all given* spaces could be given as separate space-points is not even a possible hypothesis, but a downright contradiction; inasmuch as a given separateness is a given externality, in short a given space intervening between given space-points. Though this may sound in some ears like dialectic, I am confident that it is nothing more harmful than accurate description and loyalty to definitions where loyalty is needed for the description's sake.

2. The number of nerve-termini is not the essential condition determining the form of the retinal image, though of course it is influential in various ways. Relative position is what counts. Indefinitely many different sets of nerve-termini can be the means of yielding the same perceived form. What would be the smallest group capable of producing, say, an empirical triangle, we do not know; the behavior of *minima visibilia* in human perception makes probable that fully a dozen termini must normally be involved, and maybe twice as many. I can conceive, though, of a retina so perfectly organized that six or seven rods would do the business, and without involving any structure or function radically different from those of the human. But this is beside the point; the crux is in distinguishing the retinal determinants of perceived form from those of perceived size. The former owe their efficiency to some kind of active cross-relation—call it synthesis, if you will, provided you do not invoke some spook, like the ego, to explain it. Though all direct evidence is lacking, there is a reasonable probability that either the horizontal cells or the immensely numerous lateral fibers in the retina make known visual forms; at all events, their presence and their position relative to the rods and cones suggest their connection with no other peculiarity of visual space. To be sure, the number of nerve-termini stimulated will generally influence the form perceived and, on the other hand, the perception of size always involves the formalizing or synthetic function. Indeed, on this second matter, I incline to go the extent of saying that all perception of number and size, excepting only the two limiting cases of a single *minimum visibile* and the total field of vision, is formalizing; that is, discrete points or masses can arise only as differentiations within a group. Even random dots on a sheet of paper can be numbered only in so far as the spaces between them are sensed *as* intervening, which is to say, *as* extension groups. But there is in all this absolutely nothing precluding or even resisting the notion that the number of nerve-termini affected only secondarily determines visual forms. If these very sketchy observations are enough to substantiate my point or even to make it entertainable, a serious objection drawn from introspec-

tion goes by the board. I refer to the fact that, in perception, forms do not vary with their size; thus, a triangle may double or quadruple its area without the slightest change of contour or geometrical integrity. Here the Kantian-Wundtian investigator sometimes thinks to find a powerful argument for two indispensable theories of idealistic psychology; (1) the "creative synthesis" and (2) the localization of this high function in the brain (usually the cortex). As a matter of fact, though, these questionable and ambiguous hypotheses can derive not the least support from that source except by ignoring histology and conceiving the retina, quite antiquely, as a sieve with pores or as a mere bundle of telegraph wires spread out at their ends and brought together as a cable in the optic nerve. But this brings me to the third objection.

3. "The immediate condition of the feeling," says Professor James, "is not the process in the retina, but the process in the brain"; and this, he adds, may no more resemble a triangle than redness does. His first point may be granted, at least in so far as the present topic is concerned; but please note that it has relevance to Professor James's argument only through the further assumption that the immediate condition, the brain process, does *not* consist, at least in part, of characters transmitted unchanged from the periphery. But it is precisely this assumption that constitutes the issue raised about the correspondence between retinal image and perceived form. To appeal to it is obviously to beg the whole question. Why should anybody suppose that the distribution and number of rods and cones stimulated do not peculiarly qualify the neural current—or whatever it is that gets to the brain—and that this current is so utterly different from the electric current that its features at the point of inception go lost altogether a few inches further up the conducting tract? The question has only two general answers. One is some metaphysical theory which makes every change of relation at a given center or node of relations modify all the characteristics of that center or node. The other—and the only one which any psychologist to-day will knowingly advance—consists of empirical evidences. So far as I have been able to understand these latter, however, they all are grounded upon the crudest histology and inaccurate descriptions of visual space.

To return to the independent variation of form-quality and size, this is evidence of "creative synthesis," in Wundt's sense, and of the central *locus* of this function only by the purest postulation; which is to say, only by assuming what you want to prove, namely, that some stratum of retinal neurons does not sense geometrical patterns. Maybe it does, and maybe again it doesn't; but you are not going to decide the question, for the biologist at least, by a mere say-so in

favor of one opinion or the other. To say that you can not imagine how the retina could accomplish the feat is to aid or injure neither opinion; for if you object to immediate retinal synthesis because you can not think out its details, you must protest equally against synthesis in the cortex or by an ego. But, in a general way, retinal form-sensing appears to me a much less obscure process than that of any other visual function. For instance, may it not be that the horizontal cells sense the spatiality of the initial disturbances in rod and cone cells in a manner essentially analogous to that in which a magnetic field represents an electric field? The horizontal cell lies at right angles to the rod-cone cell system, even as the lines of magnetic force lie with respect to the electric current and its field. If, now, the ether vibrations are at bottom only a kind of electric disturbance, as physicists almost unanimously hold to-day, then we picture the retinal process quite comprehensively by supposing, in accord with all psychologists, that the three accepted characteristics of the *forward drive* determine the peculiarities of the light and color, while the *lateral drive* gives the space quality.[1] Such a conception, I am sure, would greatly simplify our stock puzzles of visual perception: to name only two, it would at least make comprehensible the odd fact that, though we never sense color without extension, we do sense extension without color in extreme peripheral vision; and it would also be an adequate physical explanation of the still more curious fact that a peripheral stimulus which yields only a colorless extension when not moved across a retinal tract, develops a color *quale* upon the slightest lateral displacement.[2] But, above all else, it would serve our present desire by showing that visual space-forms behave exactly as magnetic field-patterns do, in so far as the latter do not *necessarily* vary with their size nor yet with the number of electric currents cutting across and determining them. Elementary experiments in the physical laboratory demonstrate this

[1] My use of the word "drive" implies no hypothesis of ether displacement. "Stress," "tension," or "potential energy" would do as well. Whether electromagnetic phenomena are genuine ether motions or something else is irrelevant to the present hypothesis; the two essential and, I believe, undisputed points are (1) the relative direction of electric and their accompanying magnetic forces, and (2) the correlation of the two forces (every electric current sets up a magnetic field, and every magnetic field, when moved, sets up an electric current).

[2] To clarify these and all other interpretations springing from the hypothesis is a hard undertaking which can not be entered upon here. All that I would do here is to suggest enough about the bearings of the hypothesis so that it will not seem a "long shot" or a momentary flash of scientific fancy. I hope, in the near future, to read off in its terms a large number of established and obscure psychological facts. Whether it will stand or not, it is the *kind* of interpretation wanted.

last fact; hence I need not repeat here in detail how, for instance, by adding new electric units in the proper manner to a given electromagnetic field (most easily, of course, to the exterior of the field rather than by interpolation), the intensity of the central (original) field grows, but its pattern of stress or tension lines remains substantially what it was at first. If, now, the magnetic field is the stimulus of the space-sensing neurons, its *intensity* determines the sensed *magnitude,* while its *pattern* determines the sensed *form.* And as the intensity may be increased either by increasing the number of electric units across the field or by increasing the electric force of the units already in the field, so too the sensed magnitude may be increased either by increasing the number of rods and cones stimulated and communicating laterally with a given horizontal cell or else by increasing the stimulus in the rods and cones already involved. This second case, you will observe, roughly covers the phenomena of irradiation and possibly many illusions of size, particularly pathological macropsia and micropsia.

Though I believe the above hypothesis gives the clue to an explanation of space vision, I do not argue it here. It may be quite wrong. I cite it merely to show the easy conceivability of putting all fundamental qualities of seen space in the peripheral sense organs. And, be it recalled, my motive in showing this much is to forestall an overhasty appeal to central synthesis or to *a priori* forms of experience. To attribute to such transcendent functions or entities the moulding of psychic complexes which indubitably *seem* to be given no less objectively than sunlight is—to do this, I say, before having tried to correlate those complexes with well-authenticated, observable differences in stimuli and in peripheral structure, may be pleasant metaphysics, but it is assuredly bad scientific method. A grosser violation of the law of parsimony there could scarcely be.

4. Genetic psychology has advanced so far, since Professor James's classic "Principles" first appeared, that his last objection to the correspondence between retinal image and perceived form probably is less generally approved than it once was. Professor James himself may, for aught I know, long since have stricken it from his platform. I shall consider it here, though, because it introduces us gradually to the supreme issue which the following study of reflex-imitation grazes, namely, the controversy over the prior right of psychology or of biology to found our theories of reality and conduct. "Grant," says the psychologist, "that the eye does cognize retinal patterns. The mystery is as deep as ever. Why, as Professor James puts it, are we so much better cognizant of triangles on our finger-tips than on our back, on our eye than on our ear? And why, as Thomas Brown puts it, do we not smell octagons and hear tetra-

hedrons?'' These are provincial queries, difficulties which arise only if one refuses to look beyond the traditional confines of psychology for answer to problems within them. One glance at biology and its concepts of evolution makes nonsense of such doubts. No matter what or why or how evolution is, in any case it can readily account for the absence of square odors and curving sounds from human experience. Indeed, it makes them vastly more intelligible in their missing than in their appearance. The sense of touch is, by pretty general acceptance, the primordial one and, as will be pointed out more fully later, its earliest development seems to have been toward a space sense. From the naturalistic point of view, this was a first exigency, inasmuch as the sensitive organism lived in a really extended world to whose spatially marked differences it had to adjust itself. The organic medium of sensitivity of space had to develop at the point of contact with alien spaces, but nowhere else; hence the more or less distinct feelings of extent and position from all stimuli of the body's surface (including the alimentary canal) and the pretty uniform absence or exceeding vagueness of such feelings in connection with stimuli beginning anywhere inside one's skin. To the biologist, this cleavage suggests the thoroughly objective nature of space, though not necessarily a ''copy theory'' about our experiences of space. But—what concerns us much more deeply here—the common spatiality of peripheral sense-products, far from rendering more likely the same development of space *qualia* in all specialized sense organs, makes this outcome the least probable of all, under any evolutionary hypothesis whatsoever. We should expect one or two organs to grow toward the more complete knowing of space structures, while another attunes itself to one peculiarity of matter, another to some other cosmic character, and so on. Allow the right of such anticipation, and the correspondence between retinal image and perceived form shows up as no odd accident, but rather as a step toward more perfect representation of its environment by an organism; and the absence of a correspondence between the geometrical pattern of auditory nerve-termini and the harmonious sound they yield only confirms superfluously what we all know, to wit, that the basilar membrane, and its colleague neurons, are engaged in selecting and reacting to some cosmic peculiarity other than extension.

I do not believe many persons, even among those who deny the significance of the correspondence we have been considering, will hold out with Thomas Brown or Professor James against the biologists. It will be generally conceded that there is no mystery in a specialist knowing space as lay brethren know it not. But, unfortunately, the biologists' contention, granted in such trifling matters, is ignored in the greater issues. ''Perhaps,'' says the psychologist,

"Darwin and his clan can force me with their principles to grant my eyes unique space-sensing powers. But by that they have not wrung from me a confession that the spaces I perceive exist apart from my nerves. If my friend, Smith, can turn his ophthalmoscope into my eye and detect there an image having a shape like the shape of the object I am at the same instant perceiving, that indicates only that, for the sake of the more accurate or the more useful *a priori* synthesis or mental creation, the spaceless vital force which is my self has so moulded itself—spacelessly, of course,—that one detail of its structure has one phenomenal quality somewhat like a quality concocted by my self in noumenal conjunction with *Ding an sich.*" Whether in this Koenigsberg jargon or not, almost every psychologist, not excepting those who pursue the genetic method, is to-day championing this intrinsically idealistic doctrine, while the more philosophical are explicitly denying, with lengthy proofs, that perception is, in *any* sense whatever, a copying function. So long as they stay at home dissecting their own minds, these thinkers get along passably. But when they crave, as all of them do, sooner or later, to know how their minds came to be what they are, and in the remarkable bodies they inhabit, they unhesitatingly fall back upon various principles such as "adaptation," "socialization," "differentiation," "natural selection," and the like. So be it. How can they do this, though, yet clinging to a belief in an unextended ego living in an unextended world? If space is not real, substantially as the ordinary man thinks it is, but a hyperchemical product of ego and world; and if the latter "elements" no more resemble space than oxygen and hydrogen do water, what and why is "adaptation," what the utility of inventing space with all its wearying distances, its inaccessible heights, perilous abysses and most vexatious antinomies? Men like Driesch and Bergson, scenting this danger from afar, have sought to meet it with a general metaphysical biology, which, like most ventures metaphysical, exhibits astounding skill in picking out facts that fit and overlooking most others. It is the realist's privilege, when, on metaphysical ground, to favor himself in the same liberal spirit. Out of scores of homely facts, therefore, I shall pick but two, the retinal image and reflex imitation, both especially convenient; and I shall inquire, in the next paper, how a psychologist can at the same time be an idealist in his theory of perception and any kind of an evolutionist in his theory of the origin and shaping of the organs of perception.

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THE TREATMENT OF "OPPOSITION" IN FORMAL LOGIC

THOUGH a number of good text-books and elementary treatises on formal logic have recently appeared, the subject of the "opposition of propositions" is still usually put before students in a form very similar to that in which Aristotle left it. But that form is conspicuously deficient in clearness, precision, and systematic completeness. It is as if the syllogism were treated merely in a vague and general way, with no rules more detailed than the *dictum de omni,* no distinctions of mood and figure, no attempt at a complete enumeration of valid moods. In other words, the logical principles justifying the so-called "square of opposition" are, in no text-book known to me, definitely and lucidly worked out. The consequence is that college students commonly have difficulty in seeing the *why* of the relations with respect to joint truth or joint falsity that hold good between contraries, contradictories, and subcontraries; and many students, unable to reason through for themselves the logical necessities involved, merely stow away the "square" in their memories, upon the authority of book or lecturer—the one thing absolutely inexcusable in the study of formal logic. There is, however, a way (and, I think, only one way) of presenting the subject with system, precision, and complete self-evidence; and the logically adequate mode of presentation is also, experience leads me to believe, the pedagogically effective way, even with quite immature students. The matter is obvious enough, and the method in question is, no doubt, used by many teachers of logic; but it seems worth while to call attention to it in print, in the hope that it may come to be more generally used, both by teachers and by writers of text-books.

A. The Number of Possible Relations between the Denotations of Any Two Terms.—It is well known, and it is easy to demonstrate (though many text-books conceal the fact as if it were a dark secret), that there are five, and only five, conceivable relations of mutual inclusion or exclusion between two terms; and that any two terms whatever must, with respect to their areas of denotation, stand to each other in some one of these relations. In the concise phrasing of Venn: "Given one class as known and determined in respect of its extent, another class, also known and similarly determined, . . . can coincide with the former, can include it, be included by it, partially include and partially exclude it, or entirely exclude it. In every recognized sense of the word, these are distinct relations, and they seem to be the only such distinct relations which can possibly

exist.'"[1] To formulate this more fully: if *S* and *P* be two terms whose denotation is *not* known, it is possible that they may hold to one another any one of the following relations, but it is not possible that they hold none of these relations:

1. All *S* may be all *P; i. e.,* the two areas of denotation may be coextensive.
2. All *S* may be merely some (and not all) *P.*
3. Some *S* may be all *P.*
4. Some *S* may be merely some *P,* while some of it is not *P.*
5. No *S* may be any *P.*

These relations would be graphically exhibited, in the usual manner, as follows: (1) By a diagram in which circle *S* and circle *P* are coextensive; (2) by a diagram in which circle *S* is within *P* and of less extension; (3) by a diagram in which circle *P* is within circle *S* and of less extension; (4) by overlapping circles, and (5) by mutually exclusive circles. It is to be observed that these formulas and diagrams express absolutely unequivocal situations—so far, at least, as is possible when the only quantitative distinction to be taken into account is that between whole and part; further, that with respect to the real relations of any two terms, the situations given are reciprocally exclusive as well as jointly exhaustive. In other words, the actual denotations of any two terms not only must be related in one of these ways, but also, they can not be, in fact, related in more than one.

B. The Import of the Four Types of Categorical Propositions with Respect to the Denotative Relations of their Terms.—The ordinary categorical propositions are, with one exception, notoriously incapable of expressing unequivocally the relations of their terms with respect to mutual inclusion or exclusion. What this means is that a given proposition known to be true does not enable us to know which *one* of the possible relations of the subject and predicate —in one of which, and one only, those terms really stand—is the actual relation. One who affirms such an equivocal proposition affirms merely that the two terms in question are related in one or another of two or more enumerable ways, and that the terms are not related in certain other ways (implicitly) excluded from that enumeration. Consequently, to make explicit in a perfectly clear

[1] Venn, "Symbolic Logic," 1894, pp. 5 ff. Venn cites several earlier writers who have noted this fact and insisted upon its significance for the clear explication of the denotative import of ordinary propositions, and ascribes the earliest statement of it to Gergonne. Says Schröder ("Vorlesungen über die Algebra der Logik," 1891, Bd. II., 106): "These five relations were perceived by no one, from Aristotle's time down to the beginning of the nineteenth century (1816), when, so far as is known, they were first explicitly brought to light by Gergonne."

and systematic manner the denotative import of each of the four types of categorical proposition, it is necessary to enumerate, in the case of each, all of the real situations compatible with the truth of the proposition. In other words, to understand what, in extension, the *A* proposition means, we must set down every relation between *S* and *P* which, if real, would justify the affirmation of *A*. Proceeding to this enumeration, we get the following result:

The *A* proposition is compatible with the reality of either relation (1) or (2); *i. e.*, one who affirms *A* declares that either relation (1) or else relation (2) is the actual fact; that, however, only one of these is actual; and that no other relation (of the five) beyond these two is actual. The *I* proposition is compatible with either (1) or (2) or (3) or (4); *i. e.*, whoever affirms it, declares that one or another of these relations is actual; that, however, only one of them is actual; and that no other relation is actual. With *E*, only relation (5) is compatible. With *O*, relations (3), (4) and (5) are compatible. In all the equivocal cases, it should be clearly understood, the relations enumerated as compatible with the given proposition are not jointly affirmed, nor is any one specifically affirmed. What the proposition most definitely affirms is the unreality of all the relations *not* enumerated under it; with respect to those enumerated, it virtually bids us hold our judgment in suspense. If students are to be taught to regard propositions as giving them any information at all about the comparative denotations of subject and predicate, they should be taught (as, in text-books, they usually are not) precisely and comprehensively what that information in each case is. In short, the foregoing seems to me the only sound way of presenting the doctrine of the denotative import of propositions.

C. Application of the Foregoing Principles to the "Opposition of Propositions."—In the light of the principles just set forth, it is possible to formulate rules of self-evident necessity, covering the possibility of joint truth or joint falsity of any two propositions having the same matter but differing in form. To frame these rules, it is needful only to glance at the lists of real relations compatible with the truth of each type of proposition—remembering that, so far as the proposition shows, *any* one of the relations enumerated under it is equally likely to be the one real relation; that no relation not enumerated under a given proposition admits of the truth of that proposition; and that, since any two terms must be related in one or another of the five ways, no pair of propositions can be jointly affirmed (or denied) if that would imply, for any two terms, the unreality, with respect to them, of *all* five denotative relations. The rules, then, are obviously as follows (letting the term "case" stand for "possible real relation of mutual inclusion or exclusion between the given subject and predicate"):

I. Where all the cases compatible with a given proposition are also compatible with another proposition (having the same matter), the truth of the latter may be inferred from the truth of the former.

II. Where only *some* of the cases compatible with a given proposition are also compatible with another proposition, from the truth of the former we can not infer that the latter is true, but as little can we infer that it is not true, *i. e.*, it remains doubtful.

III. Where two propositions are compatible with no common cases, from the truth of either the falsity of the other may be inferred.

IV. Where two propositions are compatible with no common cases, but between them exhaust all five possible cases, from the falsity of either the truth of the other may be inferred.

Examining the several propositions with these rules in mind, we see, for example, that Rule I. covers the relation of *A* to *I*, since both cases enumerated under *A* (1 and 2) are also enumerated under *I*. Hence, if *A* is true, *I* is true. Rule III. covers the relation of *A*'s truth to both *E* and *O*, since *A* has no cases in common with either of them; hence, if *A* is true, *E* and *O* are false. Rule IV. covers the relation of either *A* or *I* to *O*, since, if the cases compatible with either *A* or *I* be added to those compatible with *O*, all five conceivable cases will appear in the enumeration. Hence, neither *A* and *O*, nor *I* and *O*, can both be false; if one of either pair is false, the other must be true. In like manner, all the results set forth in the books under the name of "opposition" can be worked out.

This may at first seem longer and more complicated than the usual way of setting forth the subject. Even if it were so, it would be a preferable way; for it has, what the customary mode of exposition seems to me to lack, the merit of completeness of demonstration, and that sort of clarity for the understanding which comes only with the sense of having looked a problem through and through, from foundation to top, and of having noted everything pertinent that there was to note about it. And, in fact, the matter is, for teaching purposes, extremely simple to present. It requires only the drawing of five circle-diagrams; the assignment of a conventional number to each diagram; and then the setting down, opposite each type of proposition—*A*, *I*, *E* and *O*—of the list of cases compatible with it. The rest *saute aux yeux* of any fairly intelligent student. Indeed, the three topics here dealt with—under sections *A*, *B* and *C*—may best of all be given students in the form of problems to be worked out by themselves. There are, after all, great compensations in the fact that some important principles and interesting chapters of formal logic are left out of most of the books in current use as college texts. For the ideal teaching of logic would assuredly dis-

pense with text-book expositions for all parts of the subject, and would invite students to repeat, and improve upon, the adventure of Aristotle—with only the aid (but the enormous aid) of clearly formulated statements of the next things to be looked for at each point—and, perhaps, for the duller wits, a little lifting over one or two *pontes asinorum*. No other object of study lends itself so perfectly to this pedagogical method.

Nothing that has been here said is meant to prejudice any of the ulterior questions of logical theory. Though I do, in fact, think it an error to maintain (as Mr. H. B. W. Joseph has most recently done) that "the predicate of a proposition is not thought in extension," I do not suppose that those who hold that view would deny that propositions may, for elementary pedagogical purposes, be treated as having a denotative import with reference to both their terms. At all events, in much current teaching, and in the most widely used manuals, they *are* so treated. And so long as this is done, it seems desirable that all the facts about their denotative import, and the immediate inferences which are justified by those facts, should be set forth in a logically cogent and a logically complete manner.

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REVIEWS AND ABSTRACTS OF LITERATURE

La définition de l'être et de la nature des idées dans le Sophiste de Platon. Auguste Diès. Paris: Felix Alcan. 1909. Pp. a–c + vii + 140.

The scope of this admirably conducted inquiry is sufficiently indicated by the title. Like his countrymen, M. Piat and M. Brochard (*L'Année Philosophique*, 1907), M. Diès holds, as against the majority of German scholars, that the *Sophist* does not present a new view of reality, which sets it in opposition to the so-called "earlier" dialogues of Plato. He is, however, fully aware of the difficulties raised by the discussions of the *Sophist* and conscientiously sets them forth. It is clear that in this dialogue a certain shift is observable in the direction of Plato's interest, in that concrete reality is accorded a higher value than in his earlier thought. This observation led many scholars in former years—and there still remain a few of that persuasion—to regard the *Sophist* as an expression of the thought of Aristotle, since he too tended to think of the concrete as possessing the greater reality. But every student of Aristotle must soon become aware that the Stagirite was hopelessly divided, attaching supreme value now to the concrete, now to the abstract, and consequently failing to harmonize his system of thought. The same implicit contradiction is apparent in all the maturer works of Plato, the *Republic*, *Philebus*, and *Laws*, no less than the *Sophist*. In all these dialogues Plato

sought—ineffectually, to be sure, but none the less sincerely—to mediate the Ideas back to concrete reality; but the Ideas still remained for him, in the *Sophist* as truly as in the *Republic,* as the expression of supreme reality. Once this fact is noted and its significance apprehended, it is clear that Aristotle could not have written the *Sophist;* for in his Logic, which is his earliest systematic work, the dualism in Aristotle's thought is fully, even painfully, apparent.

It is impossible here to discuss at length the argument of M. Diès. He shows familiarity with the German literature of his subject, but singularly enough appears to have no knowledge of the strongest presentation of the essential unity of Plato's thought, which is his main thesis. I refer, of course, to Professor Shorey's "The Unity of Plato's Thought," Chicago, 1903. The proof-reading, especially of the Greek texts, as shown by two pages of *Errata* appended and still incomplete, appears to have been done after the book was printed. M. Diès would have done better in discussing Platonic terms to have inserted the Greek words consistently.

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Text-Book of School and Class Management: Theory and Practise. Felix Arnold. New York: The Macmillan Company. 1908. Pp. xxii + 409.

Education, it is asserted in the preface to this volume, is still in the age of lean kine, and management is one of the leanest. Recent books which have appeared show the inadequacy of the older treatments, and a complete text-book is still lacking. The present volume aims so far as possible to meet this lack.

For the practical aspects of the subject the author has depended upon "his own tested experience" and "that of progressive teachers and principals" whom he has had the good fortune to know. For the theoretical aspects he has consulted the "best authorities" (a very remarkable list —a list indicative of a vast amount of reading!) and "has sought first-hand information at every point." The chief obligation, it is stated, is to the works on "Mental Development" by Professor Baldwin. Management of a school refers "to its control by governing officials. It implies direction and support by school boards. It presupposes cooperation between principal and teachers. It necessitates contact between teacher and pupils, and pupils and principal." This forms the material of the discussion. The present volume deals with the subject of "cooperation between principal and teacher, and class management." Separate volumes will be devoted to a discussion of (1) organization, classification, the health of the child, school hygiene, and the school boards, (2) general method in instruction. Each volume of the series will be complete in itself. This first volume, "School and Class Management," treats the subject in remarkable detail. There are the two parts (1) Principal and Teacher, (2) Teacher and Child, developed through twelve chapters. After a discussion of the respective functions of the teacher and principal there is

considered the question of their cooperation in *Instruction, Discipline, Supervision,* under the headings general means, special means, approved and disapproved, individual *versus* uniform methods of instruction, misconceptions of cooperation. The teacher and child are considered in part two—and again in very great detail. The concluding chapters are entitled, The Nature of Conduct, the Sanctions of Conduct, the Kinds of Conduct, the General Development of Conduct, the Special Development of Conduct.

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JOURNALS AND NEW BOOKS

REVUE DE PHILOSOPHIE. November, 1909. *Biologie scientifique et transformisme* (pp. 481–500): H. DRIESCH. – The principal problem of systematic biology (not biology of classification) is the scientific explanation of individual differences, accidental variation. Neither the Darwinian or Lamarckian theory, both of which attribute such variation to chance, affords a solution of the problem. The principle may, however, be explained on the basis of entelechy. *Le désir et la volonté selon Saint Thomas d'Aquin* (pp. 501–515): A. D. SERTILLANGES. – The tendency to become some person other than the self is desire or appetite. This fact implies a power and a receptivity: desire is based upon actual lack and potential abundance. Volition is an appetite, the object of which is *bonum in universali. La pédagogie nouvelle* (pp. 516–527): G. JEANJEAN. – The new pedagogy—*i. e.,* pedology—is a complex of psychology and the old-fashioned pedagogy. The development of the science in America, England, and on the continent is noted. *A quoi servent les laboratories de psychologie?* (pp. 528–539): L. M. BILLIA. – In spite of a certain value the psychology laboratory exhibits certain fundamental defects: (1) the study of consciousness as determined by physiological, physical, and chemical conditions results in the destruction of psychology as such and the apotheosis of the physical sciences; (2) the consideration of the limits of our powers of feeling, intellect, and volition leads us to forget free-will and the power of extending the possibilities of feeling, intellect, and volition; (3) the worker in the laboratory tends to treat of psychology as a curiosity, an object of pure experimental research rather than as a part of life. *L'objet de la métaphysique* (pp. 540–546): T. LAURET. – Metaphysics is merely to be distinguished, not separated, from the sciences, and it is to be viewed as the "first science." Science, in the ordinary sense of the term, rests upon a metaphysical, extra-experimental basis; metaphysics, on the other hand, must have a scientific, experimental basis. *L'habitude* (pp. 547–554): G. SEMBEL. – The Aristotelian and Cartesian theories of habit are correct as far as they go, but the true nature of habit is exhibited by a combination of the theories. Inertia, inactivity, possibility, is an essential condition of habit, but in order that this quality may be utilized and directed an active principle is requi-

site. Habit serves (1) to attenuate consciousness and (2) to diminish effort. *Analyses et comptes rendus:* Hobbes, *Leviathan:* H. OLLION. G. F. Lipps, *Mythenbildung und Erkenntniss.* K. Joël, *Der freie Wille. Eine Entwickelung in Gesprächen:* E. GHERZI. G. Zuccante. *Socrate:* H. TROUCHE. A. Meyer, *Etude critique sur les relations d'Erasme et de Luther.* R. Bagardjon, *Schopenhauer der Philosoph des Optimismus:* H. OLLION. H. Arnheim, *Kant's Lehre vom "Bewusstsein überhaupt" und ihre Weiterbildung bis auf die Gegenwart:* H. OLLION. *Notes bibliographiques. Recension des revues. Chronique. L'enseignement de la philosophie dans les universités.*

REVUE NEO-SCOLASTIQUE. November, 1909. *Pour lire en psychologue la vie des saints* (pp. 505–536): C. ALIBERT. – Holiness confers upon the saint a clearer and truer vision of the creatures and of their relation to their Creator. *La théorie des moyennes et son emploi dans les sciences d'observation* (pp. 537–569): J. LOTTIN. – An examination of the different classes of averages and an inquiry into the sphere of their application. *Le sentiment de l'effort. L'effort volitionnel* (pp. 570–581): L. VANHALST. – The object of volitional effort is to will a good and to resist an evil. It resolves or tends to resolve a state of indecision. It is always voluntary, but not always free. *Mélanges et documents: Les "Sententiæ" de Gandulphe de Bologne ne sont-elles qu'un résumé de celles de Pierre Lombard?* (pp. 582–599): J. DE GHELLINCK, S.J. – Gandulph's work is in part independent of, and in part directly taken from, Peter the Lombard's "Books of Sentences." *Le testament philosophique de M. Naville* (pp. 600–607): G. LEGRAND. – An analysis of Naville's last work: "Les systèmes de philosophique ou les philosophies affirmatives." *Le mouvement philosophique en Amérique* (pp. 607–619): J. B. CEULEMANS. – A historical sketch of the philosophical movement in this country, chiefly taken from van Becelaere's "La philosophie en Amérique." *L'idée organique de l'Université* (pp. 619–624). – A fragment of a speech delivered by Ladeuze in Louvain University on October 19th. *Comptes-rendus.* H. Dehove, *Essai critique sur le réalisme thomiste, comparé à l'idéalisme kantien:* P. SCHEUER, S.J. F. Klinke, S.J., *Der Mensch. Darstellung und Kritik des anthropologischen Problems in der Philosophie Wilhelm Wundts:* P. M. M. Führich, S.J., *Rechtssubjekt und Kirchenrecht:* P. HARMIGNIE. L. Davilé, *Leibniz historien:* D. R. A. Léon, *Les Eléments cartesiens de la doctrine spinoziste sur les rapports de la pensée et de son objet:* J. H. *Morales et Religions:* TH. VAN TICHELIN. G. Vorbrodt, *Beiträge zur religiösen Psychologie: Psychobiologie und Gefühl:* J. ENGERT. J. T. Beysens, *Algemeine Zielkunde:* P. M. Mgr. Baudrillart, *Les Universités catholiques de France et de l'étranger:* L. NOËL. *Chronique philosophique. Sommaire idéologique des ouvrages et revues de Philosophie.*

ANNALEN DER NATURPHILOSOPHIE, Band VIII., Heft 4. November, 1909. *Das Geschäft als Wissenschaft* (pp. 399–412): O. NAGEL. – In commerce and industry general principles are arrived at by the same method as in experimental science. *Die Prinzipien der ener-*

getischen Psychologie (pp. 413–470): N. KRAINSKY. – The term energy is applied in characteristic ways to the "ego" and to the several phases of consciousness, and equivalence is asserted between the stimulus and its effects in sensation and imagination, without clarification of the problem what common meaning may lie under these two applications of the term energy, and how equivalence may be demonstrated. *Grund und Ursache* (pp. 471–476): W. H. FRANKL. – Two short notes. *Über Kometen als kosmische Analytiker* (pp. 477–482): V. GOLDSCHMIDT. – Comets set glowing the matter suspended in interplanetary space, revealing its varied composition. *Die Naturphilosophischen Anschauungen im altindischen Denken* (pp. 483–494): R. STUBE. – The doctrines of Kapila, a realist and dualist, and of Kanada, a materialist. *Über den analytischen Character des Existenz-theorems in der reinen Mathematik* (pp. 495–502): H. BERGMANN. – For logistical mathematics existence means merely absence of contradiction. *Neue Bücher* (pp. 503–506): W. O. Hans Driesch, *The Science and Philosophy of the Organism.* Kurt Lasswitz, *Seelen und Ziele. Beiträge zum Weltverständnis.* M. Apel, *Kommentar zu Kants "Prolegomena."* K. Braeunig, *Mechanismus und vitalismus in der Biologie des neunzehnten Jahrhunderts.*

REVUE DE METAPHYSIQUE ET DE MORALE. November, 1909. *Sociologie religieuse et théorie de la connaissance* (pp. 733–758): E. DURKHEIM. – Our categories play a preponderant rôle in our thought, and as all our civilization is condensed in them, no object is more appropriate for philosophic study. *La philosophie de Jules Lagneau* (pp. 759–807): G. DWELSHAUVERS. – A systematic, objective study and a brief appreciation of Lagneau's philosophy. *La nature de la pensée logique* (pp. 808–823): K. B.-R. AARS. – An attempt to establish for scientific thought the distinction between cause and ground or reason. Four notions of cause are distinguished. *Correspondance inédite de Ch. Renouvier et de Ch. Secrétan (Suite)* (pp. 824–835). – The continuation of a personal correspondence interspersed with philosophic comments. *Etudes critiques. La Morale des Idées-Forces:* L. WEBER. *Le VI^e Congrès international de Psychologie. Tables des matières. Supplément.*

REVUE PHILOSOPHIQUE. December, 1909. *La prééminence de la main droite: étude de polarité religieuse* (pp. 553–580): R. HERTZ. – The differentiation of the sides of the body is a particular case and consequence of the dualism inherent in primitive thought. *Autour du problèm de la connaissance* (pp. 581–604): A. CHIDE. – The author draws pluralistic consequences from our failure to solve adequately the epistemological problem. *Du charactère psychologique des idiotismes* (pp. 605–625): R. DE LA GRASSERIE. – English idioms are the result of materialistic concepts and successfully avoid the animisms implied by those of European languages. *Revue générale. Sociologie criminelle:* G. RICHARD. *Analyses et comptes rendus.* Boex-Borel, *Le pluralisme:* A. REY. Windeland, *Die Philosophie im Deutschen Geistesleben des XIX. Jahrhunderts:* J.-H. JUQUET. C. Henry, *Psychobiologie et énergétique:* A.

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NOTES AND NEWS

THE following summary of papers read before the Anthropological Society of Washington is from *Science* for January 28:

"At the 439th meeting, January 4, 1910, Dr. Aleš Hrdlička, of the National Museum, exhibited a cast of the lower jaw of *Homo heidelbergenesis* donated recently to the National Museum by Professor Schoettensack, of Heidelberg University. This jaw, which is preserved at the university and has been described in detail by Professor Schoettensack, was found less than two years ago near the village of Mauer, 10 kilometers southeast of Heidelberg, under nearly 75 feet of loess and ancient river sand. It dates from the Upper Pliocene or the very beginning of the Quaternary period and represents the most ancient being known that can be regarded as man. To illustrate the remarkable characteristics of this jaw Dr. Hrdlička showed a number of mandibula of different anthropoid apes along with those of recent man. The paper was discussed by Messrs. Theodore Gill, G. M. Kober, D. S. Lamb, Daniel Folkmar and others.

The remainder of the evening was devoted to an address by Dr. W J McGee, on "Conservation in the Human Realm." The speaker said that the human realm may best be defined in terms of relation to the other great realms in nature; and these are most conveniently stated in the

order of increasing complexity, which may be considered also the order of sequence in cosmic development.

The initial realm is that pertaining to cosmic bodies and their interrelations; the fundamental principle comprises the actions and reactions of gravity, impact, etc., which together have been denoted molarity; the field is largely covered by astronomy, with a part of physics. The second realm pertains to atomic and certain molecular interrelations; its fundamental principle is affinity; and its field coincides fairly with chemistry. The third realm is that of organic activity; its principle is vitality, which directly and indirectly accelerated and multiplied the chemical differentiation of the earth-crust; its field is covered by a large part of biology, with cognate sciences. The fourth realm (which is closely allied to the preceding) pertains to those organisms so complete in themselves as to be self-active; its principle is motility; and its field is covered by zoology and allied branches of knowledge. The final realm is that in which motile organisms are so completely self-active as to react upon and dominate lower nature; its principle is mentality; and its field is anthropology in all of those aspects resting on a psychic basis. Now the entities proper to the several realms coexist and interact; and in general the entities of each higher realm dominate over all those of the lower realms. This is especially true of mentality, which employs motility and directs vitality to control affinity and morality, thereby making conquest over lower nature for human welfare. In the power of mentality human strength lies, while danger also lurks; for the power may be, and in the absence of constraint often is, used for the destruction rather than mere subjection of the materials and forces of nature. Viewed broadly, the exercise of control over the realms of lower nature pertains to the human realm no less than do the more passive attributes of mankind."

THE reviewer in *The Nation* (January 20) of "Transactions of the Asiatic Society of Japan," Vol. XXXVI., Parts II. and III., writes as follows:

"The gem in this collection of papers is Walter Dening's review of three volumes on the Confucian philosophy in Japan by Professor Inouye Tetsujiro, of the Imperial University. In these volumes, the result of eight years of labor, we have an exhaustive and trustworthy history of Japan's three great schools. No one can understand the Japan of to-day without some knowledge of the philosophy, which for above twelve centuries has moulded the mind of Japan, producing, besides other fruits, that high moral standard of everyday life with which foreigners accustomed to associate with Japanese gentlemen are so familiar. More immediately potent in furnishing the finest specimens of Japanese humanity, and particularly in equipping those minds which shaped the interior potency of the empire before Commodore Perry and which since have directed Japan's modern career, is the Oyomei philosophy. This was founded by the last of the great Chinese philosophers (1472–1529), who broke loose from the authority of the ancients and claimed the right to interpret nature and its laws in his own fashion. By the Oyomei system, the lack of idealism in the Japanese mind is corrected, as also its tendency

to a narrow practicality. No other such lucid exposition of Japanese philosophic thought exists."

THE Western Philosophical Association and the North Central Section of the American Psychological Association will hold meetings at the University of Iowa, Iowa City, on Friday and Saturday, March 25 and 26, 1910. Separate sessions will be held Friday afternoon and Saturday morning, and a joint session Saturday afternoon. Friday evening there will be an address by the President of the Western Philosophical Association, Professor Carl E. Seashore. Titles of psychological papers should be sent to W. D. Scott, 721 Colfax St., Evanston, Ill.; titles of philosophical papers to B. C. Ewer, 614 Clark St., Evanston, Ill. Papers should not exceed twenty minutes in length. One session of the Western Philosophical Association will be devoted, at least in part, to the question of the proper contents and method of a course in Introduction to Philosophy. It is expected that the general subject of the joint session will be the Practical Applications of Psychology, Legal, Commercial and Therapeutic.

THE firm of B. G. Teubner in Leipzig has undertaken the publication of the complete works of the mathematician Leonard Euler, under the editorial supervision of Professor Rudio, of Zurich, and Professors Krozer and Stöckel, of Karlsruhe. The edition will fill forty three quarto volumes; volume 1, algebra, edited by Professor Heinrich Weber is promised for the current year.

PROFESSOR HUGO MUNSTERBERG, of Harvard University, delivered, on January 21, 1910, the second of the series of lectures being given during the college year by the Omega chapter of the Sigma Xi Society, at the Ohia State University, Columbus, O. He spoke on "The Psychologist in the Courtroom."

A DINNER was given on January 18 in honor of Professor William James, on which occasion a portrait of Professor James was presented to the University by members of the division by the visiting committee. The painting, by Miss Ellen Emmet, is of three quarter length, and life size. It will hang for the present in Emerson Hall but will be placed eventually in the faculty room of University Hall.

PROFESSOR C. J. KEYSER, of Columbia University, delivered on January 14 at Princeton University a lecture on "Ways to Pass the Walls of the World; or Scientific Speculations regarding the Figure and the Dimensions of Space."

DR. A. L. SUTHERLAND, of the Government Hospital for the Insane at Washington, has been appointed instructor in psychology in the University of Illinois.

MR. T. CASE, Waynflete professor of moral and metaphysical philosophy, and president of Corpus Christi College, Oxford, has resigned his professorship.

DR. KARL GROOS, professor of philosophy and pedagogy at Giessen, has resigned his chair at the university.